

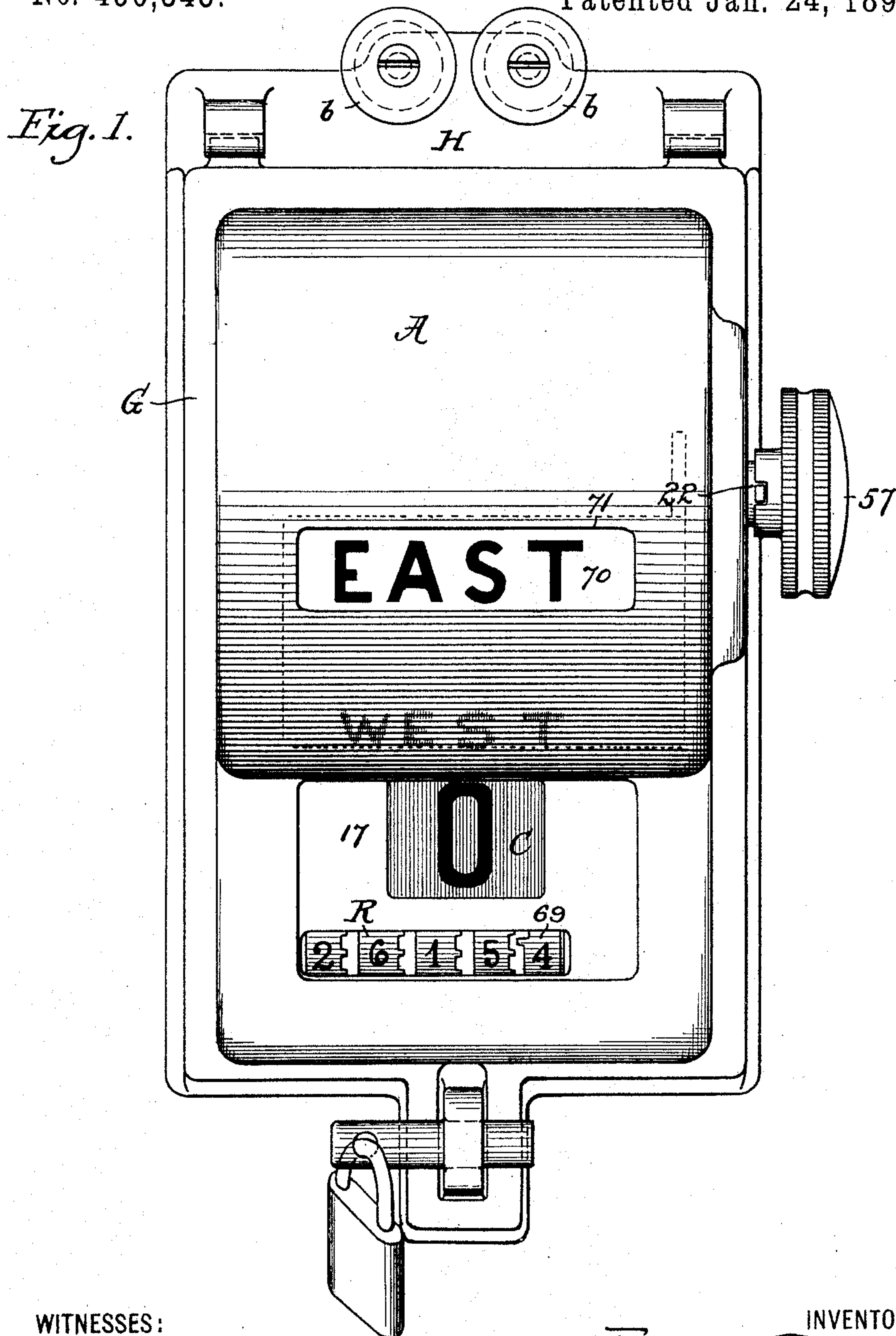
(No Model.)

4 Sheets—Sheet 1.

F. K. FASSETT & G. REIN.
STREET CAR REGISTER.

No. 490,345.

Patented Jan. 24, 1893.



WITNESSES:

Chas Hannan
M. Marler

INVENTORS

Francis K. Fassett
Gustavus Rein BY

Geo. H. K. K. K.
ATTORNEY.

(No Model.)

4 Sheets—Sheet 2.

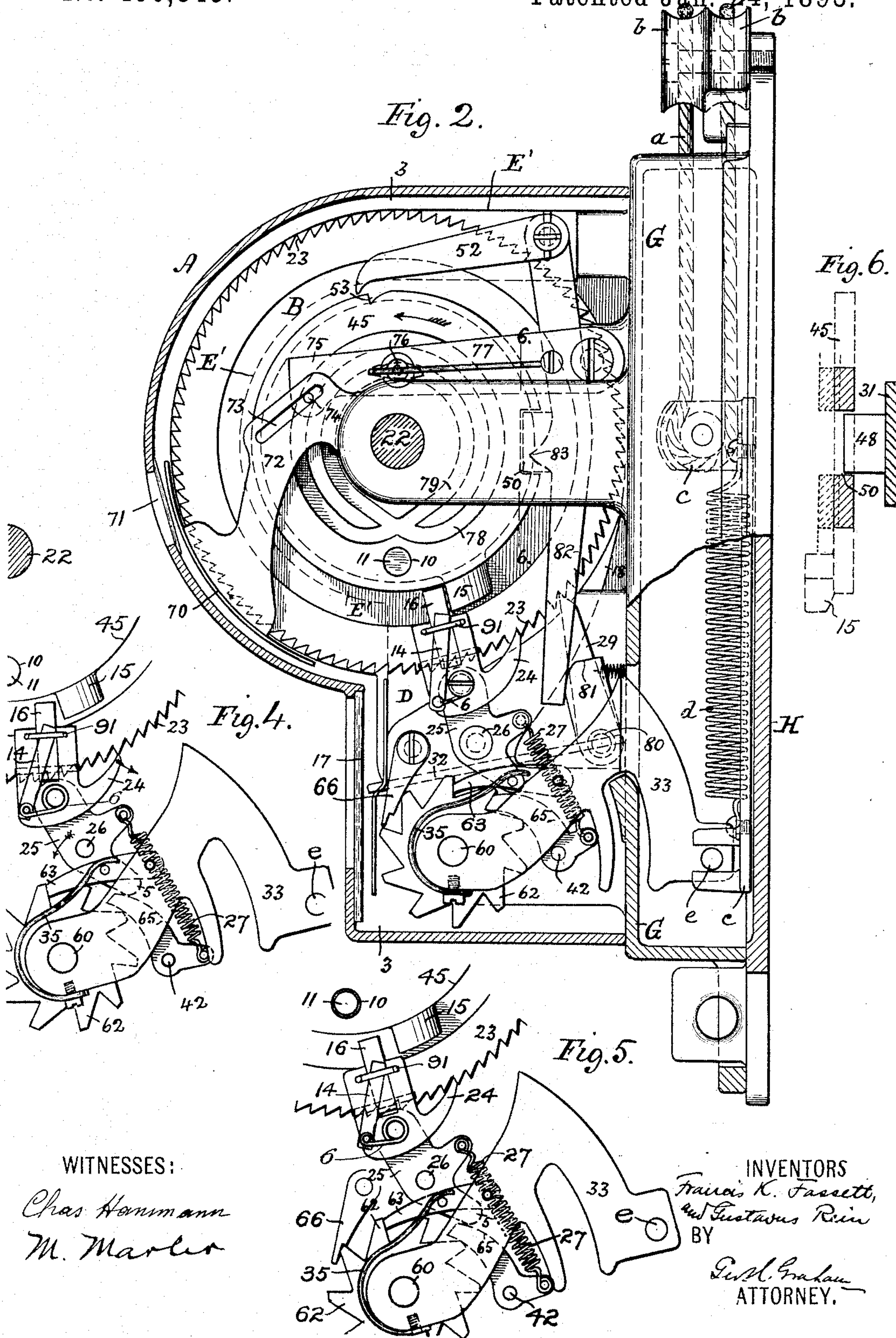
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Fig. 2.

Fig. 6.



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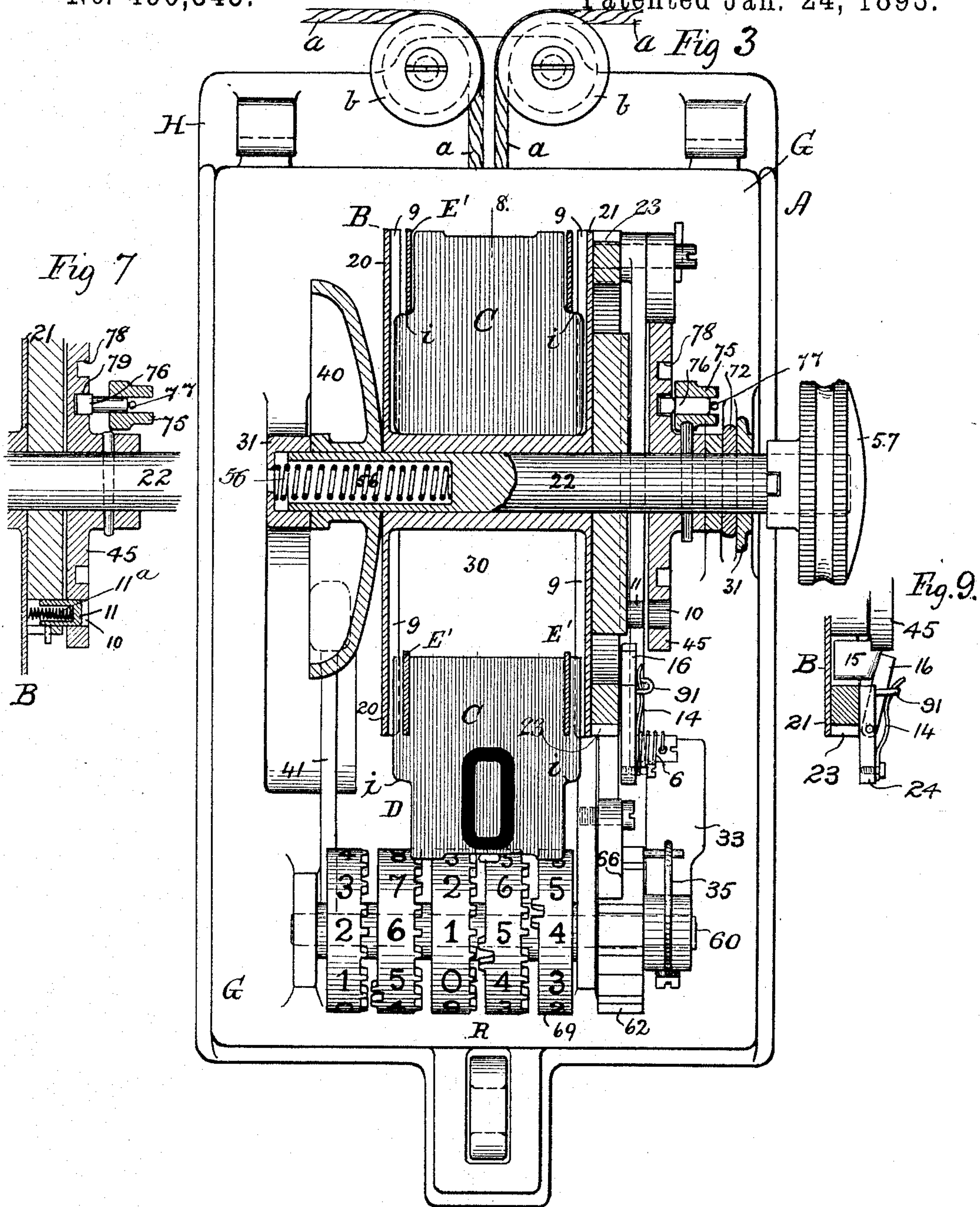
(No Model.)

4 Sheets—Sheet 3.

F. K. FASSETT & G. REIN.
STREET CAR REGISTER.

No. 490,345.

Patented Jan. 24, 1893.



WITNESSES:

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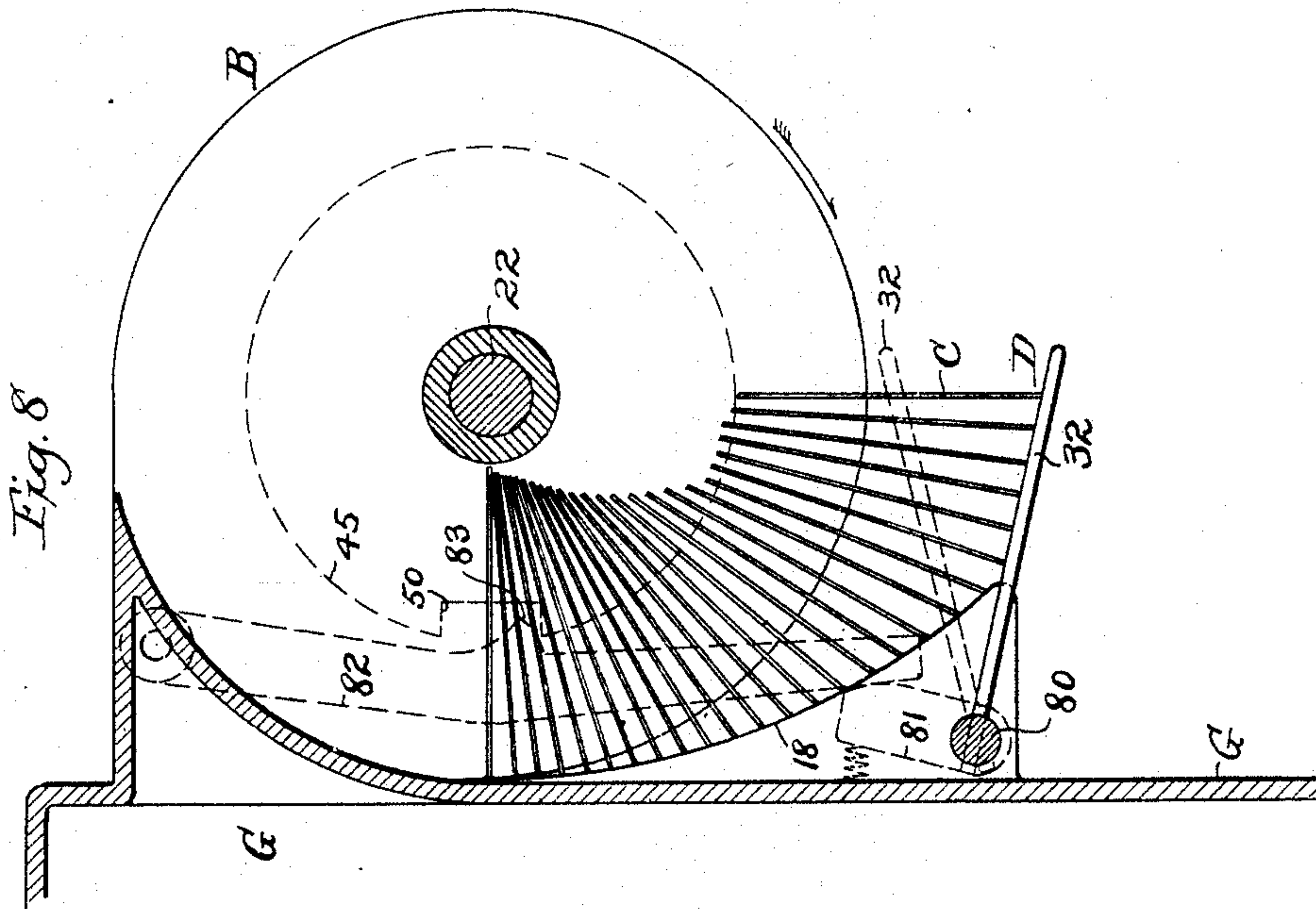
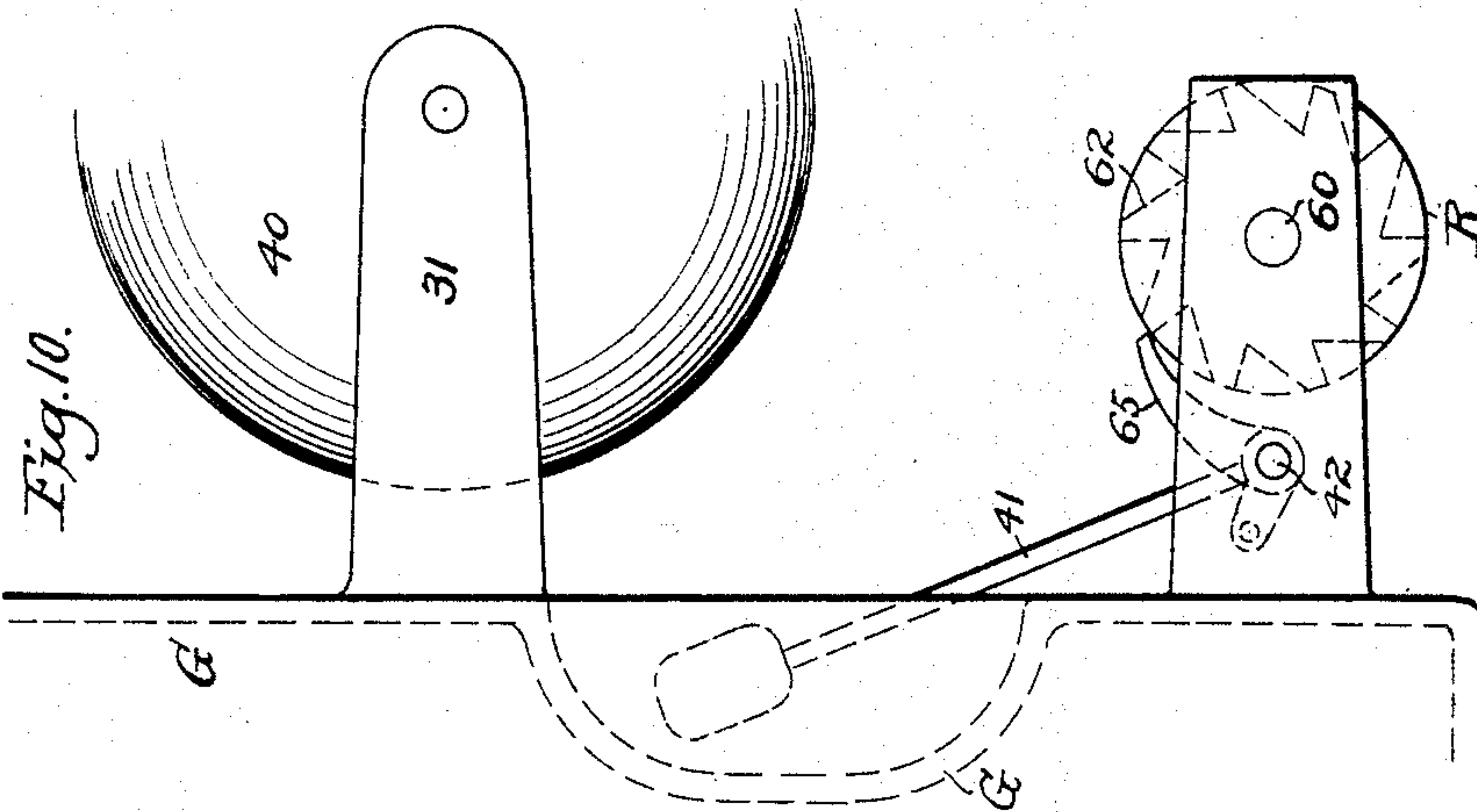
(No Model.)

4 Sheets—Sheet 4.

F. K. FASSETT & G. REIN.
STREET CAR REGISTER.

No. 490,345.

Patented Jan. 24, 1893.



WITNESSES:

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UNITED STATES PATENT OFFICE.

FRANCIS K. FASSETT AND GUSTAVUS REIN, OF ST. LOUIS, MISSOURI,
ASSIGNORS TO THE ST. LOUIS REGISTER COMPANY, OF SAME PLACE.

STREET-CAR REGISTER.

SPECIFICATION forming part of Letters Patent No. 490,345, dated January 24, 1893.

Application filed February 10, 1892. Serial No. 421,058. (No model.)

To all whom it may concern:

Be it known that we, FRANCIS K. FASSETT and GUSTAVUS REIN, citizens of the United States, both residing in the city of St. Louis and State of Missouri, have invented certain new and useful Improvements in Street-Car Registers, of which the following is a specification.

This invention relates generally to registers and more particularly to that class known as street car or fare registers adapted to indicate the number of fares received during a definite period as for instance during a trip of the car in one direction, and to register and preserve the total number of registering movements of the register.

The present invention is an improvement upon that form of register set forth and shown in Letters Patent No. 453,884 dated June 9, 1891, granted to Ehrlich and Keys embracing as in said patent a holder or carrier adapted to contain or support a plurality of indicators, representing the trip register, that may be exposed one by one in succession as the register is operated to indicate the number of fares collected; an adding or totalizing device, representing the permanent register, upon which the total number of operations of the register is transferred and preserved; a means by which the indicators may be returned to zero or to their normal starting point; and an audible alarm sounded each time the register is operated.

As a better understanding of the improvement will be had by a detailed description of the same such description will now be given, reference being had to the accompanying drawings which illustrate a practical embodiment thereof.

In said drawings: Figure 1, is a front view of the register; Fig. 2, is an irregular vertical section taken through the inclosing case, the operative parts being shown in side elevation; Fig. 3, is a vertical cross section taken on the line 3—3, of Fig. 2; Figs. 4 and 5 are detail elevations of the carrier operating pawl, its actuating arm and immediate connections in changed positions and differing from the positions shown in Fig. 2; Fig. 6, is a detail cross section taken on the line 6—6 of Fig. 2, showing the lock for the coupling disk; Fig.

7, is a detail cross section similar to Fig. 3, showing the coupling disk in its coupled position; Fig. 8, is a detail vertical section taken on the line 8, of Fig. 3, showing the means for returning the indicators to their seats in the carrier; Fig. 9, is a detail cross section in the plane of Fig. 3, showing the back stop passing the extension 16. Fig. 10, is a partial elevation looking from the side opposite to that of Fig. 2, showing particularly the means for striking the bell, many parts of the register being omitted.

As the general structure of the improved register corresponds in some respects with that shown and described in the aforesaid Letters Patent, corresponding parts in both structures will be indicated and designated alike. The register is supported by a hollow or flanged base G that is removably connected with a back plate H and mounted within an inclosing case A, the back plate being adapted to be secured in any convenient position as for instance on the side or end of a car or other vehicle. The base supports a trip register consisting of a holder or carrier B adapted to receive and support a number of indicators C that are movable with respect to the holder or carrier, so that they may be moved to expose the indications upon their faces.

The holder or carrier B consists of a pair of disks 20, 21, that are secured a distance apart to a central hub to provide between said disks a chamber 30 capacitated to receive and support the indicators. The carrier rotates loosely upon a shaft 22, that finds bearings in a pair of brackets 31 extending from the base G.

The indicators C consist of plates or tablets of rectangular form and formed of any suitable material, such as sheet metal, celluloid, and the like, and will vary in number according to the capacity of the register, as for instance, in the present case—one hundred—bearing numerals on their faces extending from 0, 1, 2, and so on, to 99 inclusive, and so arranged that as the register stands at its normal position, see Fig. 3, the zero indicator will be exposed and as the register is operated the indicators will be exposed one at a time in numerical order. The indicators are each arranged to slide in grooves 9, formed in the

opposite inner faces of the disks 20, 21, by which grooves they are guided in their movements with respect to the carrier. The indicators move freely in these grooves and are of a length substantially equal to that of the grooves so that in their normal inner position their outer edges will be about flush with the periphery of the carrier.

A little less than one half of the two opposite edges of the indicators are cut away to provide a pair of shoulders *i*, against which lie a pair of guides or guard strips *E'* that extend over the upper portion of the carrier upon the inner faces of the two disks around and down to a point at which the indicators are to be exposed, where said strips abruptly terminate. Thus while the indicators are held loosely between the disks of the carrier, they are held for a portion of the travel of the carrier in their inner positions against premature displacement, to a point where the guides abruptly terminate to permit, as in said patent, the indicators as they are brought around into position to slide by gravity partially out of the grooves in the disks of the carrier into a pocket *D* in front of an opening in the inclosing case that is guarded by a glass plate 17. The bottom of the pocket *D* is formed by a rod 32 in connection with an inclined guide 18 which gradually approaches the periphery of the carrier, see Figs. 2 and 8, and thus as the carrier rotates carrying with it the indicators, the outer edges of the dropped indicators will be gradually moved back to their normal inner positions by contact with said rod 32 and guide 18.

The carrier *B* is moved step by step by means of an actuating dog 24, which engages with the teeth of a ratchet wheel 23, that is secured to one side of the carrier. This dog is pivotally mounted to a rocking dog-carrier 25 that is loosely mounted upon a stud 26, and the dog is held to duty in engagement with the teeth of the ratchet by a spring 6. The dog is moved to actuate the ratchet and the carrier by means of a vibrating actuating arm 33, that is loosely pivoted on the outer end of a cross shaft 60. This vibrating arm in turn is moved by a cord or cords *a*, extending through the car within reach of the conductor, the inner end of which passes over one or more guide pulleys *b*, secured to the back plate *H*, and rigidly connected to the upper end of an actuating slide *c*, mounted to move vertically in bearings on the back plate and within the flanged base against the power of a spring *d*, the opposite end of which actuating slide embraces a pin *e*, projecting from the end of the vibrating arm 33. When the conductor pulls on either of the cords *a*, extending through the car, he thereby raises the actuating slide *c*, against the pull of the spring *d*, and in so doing, imparts a vibration to the actuating arm 33, thereby causing the dog carrier 25 to be rocked in one direction by the means presently to be described. When the conductor releases the cord *a*, the

actuating slide *c*, and the actuating arm 33 return to their normal positions, as shown in Fig. 2, ready to be again moved. The vibrating arm 33 in turn carries a pawl 63 that engages with and actuates a ratchet 62 fast to said cross shaft 60. With this ratchet there engages a hold-back pawl 65, mounted on the side of the frame of the inclosing case, and the rocking dog-carrier 25, carrying the actuating dog 24, is provided with an extension 5 that overlies said hold-back pawl as it is vibrated upon each step movement of the ratchet 62; said hold-back pawl 65 and the dog carrier 25 being both held to duty by a single spring 27, while the pawl 63, carried by the vibrating arm 33, is held to duty by a spring 35.

In lieu of the hold-back pawl 65, the extension 5 might engage directly with the teeth of the ratchet 62.

From the foregoing it will be seen that the vibrating actuating arm 33 and the dog 24 are independent of each other, the dog being actuated indirectly by the movement of said arm. In such movement its rocking carrier 25 is first rocked in an outward direction, as indicated by the arrow Fig. 4, carrying the dog 24 up the incline of a tooth, of the ratchet 23 against which it constantly bears under the force of its spring 6. In this movement the dog 24 has been slightly rocked on its pivot outwardly in the direction of the arrow Fig. 4, and the movement of its carrier 25 is continued until the dog is in position to drop into the next tooth, as shown in Fig. 5; and this movement of the dog-carrier 25 and the dog 24 from the position shown in Fig. 2 to that shown in Fig. 5 has occurred during the early part of the stroke of the actuating arm 33, and before it reaches its limit of movement in one direction, it being supposed that as seen in Fig. 5, the arm 33 is still moving upwardly, in which position of the parts the ratchet 62 has been moved by the pawl 63, a portion of the step by step movement so that the hold-back pawl 65 has been vibrated outward against the extension 5 of the dog carrier 25 nearly to its fullest extent. During the remainder of the upward movement of the vibrating actuating arm 33, the tooth of the ratchet 62 that is acting upon the hold-back pawl 65 is passing said pawl, and as soon as the vibrating arm and said ratchet complete this upward and forward movement, the hold-back pawl 65 vibrates, or drops into the next tooth of said ratchet, leaving the extension of the dog carrier temporarily unsupported. Under the force of the spring 27, aided by the spring 6, the rocking dog-carrier 25 and its dog are thereupon immediately caused to vibrate from the outward position shown in Fig. 5, to the normal position shown in Fig. 2, thereby feeding or carrying the carrier *B* one step forward and bringing the extension 5 again in contact with the pawl 65. This step movement of the carrier *B* and its ratchet 23 and the ratchet 62 is effected si-

multaneously with the completion of the upward movement of the slide *c* and actuating arm 33.

It has been found in practice that the spring 6 acting upon the dog 24 aids materially in restoring the dog to its normal position and thus moving the carrier forward one step, and that if this return of the dog were all that need be done, said spring would be sufficient for this purpose. Upon the return or down movement of the slide *c*, and actuating arm 33, under the power of the spring *d*, the arm 33 moves idly back and brings its pawl 63 into engagement with the next tooth of the ratchet 62. The limit of the vibrating movement of the dog-carrier is determined by the limit of movement of the hold-back pawl 65, both being returned by the same spring 27, the spring being placed under tension upon the early movement of the arm 33 so that by its power the forward step movement of the carrier B is insured. With the ratchet 62 there engages an intermediate hold-back pawl 66, which holds the ratchet against any backward movement due to the pressure of the hold-back pawl 65, should the vibrating actuating arm 33 be moved only a portion of its stroke as in Fig. 5. Any over movement of the carrier B and its ratchet 23 is prevented by a tongue or extension 16, that is carried by and supported in a recess in the dog 24 so as to be rigid therewith in lateral directions projecting at about right angles to said dog and extending to one side of an abutment 15 that projects from a disk 45, the effect of which is that should the dog 24 tend to vibrate on its pivot against the force of its spring 6, said extension or tongue 16 would meet said abutment 15 and prevent said vibration and thus hold the dog 24 into engagement with the ratchet 23 to prevent the teeth of said ratchet from passing. The cross shaft 60 carries the several wheels of a permanent register R, the units wheel 69 of which is fast to said shaft and moves in unison with the ratchet 62.

Suitable carrying devices may be employed to carry from the units wheel to the tens, and so on as is usual in this class of devices, and which need not be further explained as such details of construction form no part of the present invention.

During the ordinary step by step forward movement of the carrier B, and the exhibition of the indicators C in succession, the carrier moves independent of its supporting cross shaft 22, which remains stationary; and in order to return the carrier and its indicators to zero, or to their normal starting point, there is provided means for coupling the shaft with the carrier so that upon the completion, for instance of a trip of the car in one direction, the conductor may return the indicators to zero before starting upon another trip. For this purpose the outer end of the shaft 22 projects to the outside of the inclosing case and is provided with a hand

wheel 57, see Figs. 1 and 3, by which said shaft may be revolved. Said shaft carries the coupling disk 45 rigidly connected thereto, adapted to move independent of the carrier B laterally into engagement with the other part of the clutch as a stud 11 carried by the carrier, and upon being coupled therewith and rotated together with the carrier and the indicators around to a point where the indicator bearing the zero mark will fall to its exposed position, and the further movement of the carrier be stopped, and be ready to be again moved step by step by the conductor in indicating and registering the fares he collects. The supporting shaft 22 is adapted to move laterally through its bearings against the force of a spring 56, which tends to hold it and the coupling disk, in the position shown in Fig. 3, out of coupling position.

The disk 45 is provided with a perforation or recess 10 that is adapted to register with and be engaged by a stud 11 projecting from the side of the carrier. This stud is yieldingly mounted in the carrier, pressed to duty by a spring 11^a, see Fig. 7, so that should the disk be moved laterally toward the side of the carrier at a time when its recess 10 is not opposite the stud, the latter will be moved inward by the disk until such time in the rotation of the disk its recess registers with the stud, when the stud will automatically engage therewith. As soon as the coupling disk 45 is moved laterally against the side of the carrier, the shaft and disk 45, through the handle 57, may be rotated in the direction of the arrow, Fig. 2, and immediately the stud 11 engages with its recess 10, seen in Fig. 7, the carrier will be coupled with the coupling disk so as to partake of the rotation of said disk and move together to the completion of the rotation of the coupling disk.

The coupling disk 45 is recessed to provide a stop 50, see Figs. 2 and 6, that engages with a projection 48 extending inwardly from one of the brackets 31, the location of which stop and projection is such that as soon as the disk has completed a rotation and the indicator marked zero is displayed the stop arrives opposite the projection and upon the return lateral movement of the disk to its normal position the stop will embrace the projection and hold the disk from further movement.

Should the operator in turning the carrier back to zero fail to relieve the lateral pressure upon the disk 45, its stop 50 will pass said projection 48, so that the carrier will be rotated past the stopping point, requiring the disk and carrier to be again rotated in the same direction until the stop 50 is allowed to engage with the projection 48,—the carrier, and the disk when coupled with the carrier, being prevented from moving in the opposite direction by reason of the locking of the dog 24 in engagement with the ratchet 23 and by reason of the stop pawl 29, see Fig. 2, which also engages with said ratchet. When the disk 45

is moved laterally into coupling position its stop 50 is also moved out of engagement with the projection 48, as indicated by dotted lines in Fig. 6, so that the disk is free to be rotated; 5 and when the disk arrives back into this position and lateral pressure is relieved from the handle 57, the disk under the pressure of the spring 56 will move back into the position shown in Figs. 3 and 6, removing its recess 10 10 from the stud 11 and placing its stop against the projection 48, thus leaving the carrier in its normal position and being itself locked against movement until it is again moved laterally into coupling position. Should the 15 disk 45 be rotated but slightly after it is moved into coupling position and before its recess 10 is actually engaged by the stud 11, a backward movement of said disk will be prevented by the stop pawl 52 that will engage 20 with a recess or tooth 53 on the face of the disk 45.

The disk 45 also carries the projection or abutment 15, formed integral therewith, and in connection with the tongue or extension 25 16 prevents a backward movement of the disk while in its coupling position before its recess 10 engages with the stud. In order that this abutment 15 may pass the tongue or projection 16 of the dog 24, it is inclined, as indicated in Figs. 2, 6, and 9, and the tongue is 30 pivotally mounted on the dog and held to duty by a spring 14, which allows the tongue to yield laterally as the abutment 15 passes beneath it, as shown in Fig. 9, and to return to 35 its normal position as soon as the abutment passes it and the disk 45 arrives at the end of its rotation.

It may be remarked in passing that while the abutment 15 and tongue 16 thus perform 40 the double function of preventing the over-movement of the carrier by locking the dog 24 into firm engagement with the teeth of the ratchet 23, and preventing the rearward movement of the disk 45, it is obvious that one or 45 the other of these functions may be absent. The dog 24 carries a stirrup or guard 91 overlying the tongue 16 and limiting its outward yielding movement during the passage of the abutment 15 as in Fig. 9, the purpose of which 50 is to prevent the disk 45 from moving laterally to its normal position or leaving the stud 11, while its abutment 15 is passing beneath the tongue, thus compelling the complete movement of the disk and the return of its 55 abutment beyond the tongue 16, as in Fig. 2, before it can uncouple from the stud.

The register is also provided with means for automatically indicating the trip of the car with which the register is used, so that each 60 time the carrier is returned to zero or its normal starting position, the trip-indicator will be like-wise moved to indicate the direction of the car the next trip, and that the register has been set. This trip indicator consists of 65 a plate 70 bearing two indications, as for instance "East" and "West," either one of which may be exposed through an opening

71, guarded by a glass plate. This trip indicating plate 70 is mounted at the end of an arm 72 loosely hung upon the shaft 22 in a 70 recess between the divided portions of one of the brackets 31 and is thereby held in place on said shaft. The arm is slotted at 73 to engage a pin 74 on the end of the rock arm 75 75 pivoted to the frame of the inclosing case and having upon its inner side a laterally sliding stud 76, pressed to duty by the spring 77 and engaging with one or the other of the double cam grooves 78, 79, formed in the face of the coupling disk 45. While the stud 76 is in the 80 concentric part of the groove 79 no movement of the arm 72 and its indicating plate 70 will take place, but as it passes, by reason of its elongated face, from the end of the groove 79 into the groove 78, the arm will be rocked and 85 the position of the indicating plate changed. So, too, while the stud is passing during the rotation of the coupling disk 45 the concentric portion of the cam 78, no movement will be imparted to the arm 72 and its indicating 90 plate, but as such stud passes from the end of the groove 78 into the groove 79, the arm and plate will be rocked in the opposite direction to expose the other indication. The stud 76 is yieldingly mounted in the rock arm 95 75 so that the end of said stud may follow the coupling disk when it is moved laterally into its coupling position.

Instead of relying upon the incline 18 to return the indicators to their normal positions 100 within the carrier B, the rod 32, forming the bottom of the pocket D, see Fig. 8, is adapted to be moved into the position shown in dotted lines to elevate the indicators that may be resting on said rod 32 and move them back or 105 partially back into the carrier. The rod 32 extends from a rock shaft 80 supported on the base G, and has an arm 81 extending behind a lever 82 pivoted to the base. This lever has a projection 83 lying behind the coupling disk 45, and in line with the recess forming the stop 50. When the disk 45 is moved 110 inward laterally, its stop 50 moves over the projection 83 of the lever 82, and as the disk is rotated the lever is rocked rearward, thereby rocking the arm 81 the shaft 80, and the rod 32, and the latter is held in its moved position until the recess forming the stop 50 115 again arrives over the projection of the lever 82 when the lever 82 and rod 32 will return to their idle positions allowing the indicators to fall to their exposed position as before. 120

For sounding an audible alarm each time the register is operated step by step to indicate and register a fare, there is provided a 125 bell 40, see Figs. 3 and 10, mounted loosely on the cross shaft 22, between one of the brackets 31 and one of the disks of the carrier B. The bell hammer 41 striking the bell, is rigidly secured to one end of the cross shaft 130 42, (on which are loosely mounted the carrying pinions of the permanent register R,) to the opposite end of which shaft the hold back pawl 65 is secured, so that each time said

hold back pawl is vibrated by the feed of the ratchet 62, the bell will be sounded, simultaneously with or immediately before the step movement of the carrier B.

5 So far as the function of the stirrup or guard 91, Figs. 2, 4, 5, and 9, is concerned in preventing the premature uncoupling movement of the coupling disk 45, it may be performed by another or special instrumentality, that is
10 to say by some other device wholly independent of the tongue 16 and dog 24.

What is claimed is:—

1. The combination with the trip register, of a dog and a dog-carrier for moving the trip
15 register, a revoluble ratchet, a pawl interposed between the dog-carrier and ratchet for vibrating the dog-carrier, and a single spring connected to said dog carrier and pawl, substantially as described.

20 2. The combination with a trip register and a permanent register, each having a ratchet secured thereto, a centrally pivoted dog carrier having at one end a dog for engagement with the ratchet of the trip register and at
25 the other end an extension, an independent pawl interposed between the teeth of the ratchet of the permanent register and the extension of the dog carrier, a spring holding the extension of the dog carrier in contact
30 with the pawl, and means for moving the ratchet of the permanent register step by step whereby said step by step movements are imparted through the pawl, dog carrier and dog to the ratchet of the trip register,
35 substantially as described.

3. The combination with a trip register and a permanent register, each having a ratchet secured thereto, a centrally pivoted dog carrier having at one end a dog for engagement
40 with the ratchet of the trip register and at the other end an extension, an independent pawl interposed between the teeth of the ratchet of the permanent register and the extension of the dog carrier, a spring holding
45 the extension of the dog carrier in contact with the pawl, and an actuating arm having an axis of vibration coincident with the axis of the ratchet of the permanent register whereby its step by step movements are im-
50 parted through the pawl, dog-carrier and dog to the ratchet of the trip register, substantially as described.

4. The combination with a trip register and a permanent register, each having a ratchet
55 secured thereto, a centrally pivoted dog-carrier having at one end a dog for engagement with the ratchet of the trip register and at the other end an extension, an independent pawl interposed between the teeth of the
60 ratchet of the permanent register and the extension of the dog-carrier, a spring holding the extension of the dog-carrier in contact with the pawl, and an actuating arm having an axis of vibration coincident with the axis
65 of the ratchet of the permanent register whereby its step by step movements are im-

parted through the pawl, dog-carrier and dog to the ratchet of the trip register, and a reciprocating slide connected with the end of
70 said actuating arm for vibrating it in one direction and a spring connected to the slide to return the slide and vibrating arm to their normal positions, substantially as described.

5. The combination with the movable carrier and its indicators, and a permanent reg-
75 ister and its shaft, of a dog and a dog-carrier for moving the carrier, and a ratchet secured to said shaft for vibrating the dog-carrier and moving the permanent register, substantially
80 as described.

6. The combination with the movable carrier and its indicators and a permanent register and its shaft, of a dog and a dog-carrier for moving the carrier, a ratchet secured to
85 the shaft carrying the permanent register, the unit wheel of which is also secured to the shaft, connections between the ratchet and the dog whereby upon the movement of the ratchet the dog is vibrated and the permanent register is moved, and means for moving
90 said ratchet, substantially as described.

7. The combination with the movable carrier and its indicators, of a dog-carrier and a dog for moving the carrier, said dog provided
95 with a projecting tongue, and an abutment for the tongue, in the normal idle position of the dog substantially as described.

8. The combination with a trip register and its ratchet, of a dog-carrier pivoted exterior to the circumference of the ratchet, a spring-
100 pressed dog pivoted to said dog-carrier and engaging with the ratchet, and having a tongue extending at right-angles to the dog, an abutment interposed to meet said tongue of the dog when in its normal position, a
105 spring holding the dog-carrier in its normal position, an actuating arm for vibrating the dog-carrier and dog positively in one direction to carry the projection away from the abutment, substantially as described.
110

9. The combination with a trip register, a vibrating dog-carrier carrying a yielding tongue, an actuating arm and connections for vibrating the dog-carrier and its dog and a
115 movable abutment with which the yielding tongue of the dog may bear to hold the dog in engagement with the ratchet and to permit the passage of said abutment when the abutment is moved, substantially as described.

10. The combination with the carrier and its
120 indicators, and means for moving the carrier, of a shaft supporting the carrier and a laterally moving coupler carried by said shaft and having a laterally yielding member for clutching the carrier and returning it to the zero
125 position, substantially as described.

11. The combination with the carrier and its indicators, and means for moving the carrier, of a shaft supporting the carrier, a laterally
130 moving coupler carried by said shaft and having a laterally yielding member for clutching the carrier and returning it to the zero

position, and a stop for the coupler against which it moves as the movement is completed, substantially as described.

12. The combination with the movable carrier and its indicators, of a shaft upon which the carrier is loosely mounted, a coupler secured to said shaft and having a recess, and a yielding stud carried by the carrier and adapted to engage with the recess in the coupler, substantially as described.

13. The combination with the movable carrier and its indicators, of a disk independent of the carrier and having an abutment as 15, a dog and a dog-carrier for moving the carrier, said dog having a tongue adapted in its normal idle position to meet the abutment, substantially as described.

14. The combination with the carrier and its indicators, and means for moving the carrier, of a laterally moving coupler for clutching the carrier and returning it to the zero position, an abutment carried with the coupler and a stirrup or guard co-operating with the abutment to prevent premature uncoupling of the coupler, substantially as described.

15. The combination with the movable carrier and its indicators, of a disk adapted to couple and uncouple with the carrier and having an abutment as 15, a dog and dog carrier for moving the carrier, a tongue carried by the dog in the path of said abutment and a stirrup or guard preventing the premature uncoupling of the disk, substantially as described.

16. The combination with the carrier and its indicators, and means for moving the carrier to expose its indicators, of an incline against which the indicators bear to be returned within the carrier, and a co-operating elevating rod for aiding in returning the indicators within the carrier, substantially as described.

17. The combination with the carrier and its indicators, and means for moving the carrier to expose its indicators, of an elevating rod against which the indicators bear, a coupler for clutching the carrier to return it and the indicators to the zero position, and a lever interposed between the coupler and the elevating rod for moving the latter, substantially as described.

18. The combination with the carrier and its indicators, and means for moving the car-

rier to expose its indicators, of an elevating rod against which the indicators bear, a laterally moving coupling disk for clutching the carrier to return it and its indicators to the zero position, an arm on the elevating rod, and a lever bearing upon said arm and having a projection in the path of rotation of the coupling disk, substantially as described.

19. In a register, the combination with the permanent register having a ratchet secured thereto, of a trip register and its actuating dog, a carrier carrying said dog, a bell hammer and a bell, a single pawl between said ratchet, carrier and bell hammer, whereby effective movements of both the dog and the hammer are produced by the movement of the ratchet, and means for moving the ratchet, substantially as described.

20. In a register, the combination with the trip register and means for returning it to the zero position, of a direction plate, a revoluble double grooved cam, and an engaging stud connected with the direction plate, substantially as described.

21. In a register, the combination with the trip register, and a revoluble coupler for returning the trip register to the zero position, of a direction plate, a double grooved cam carried by the coupler, and an engaging stud connected with the direction plate, substantially as described.

22. In a register, the combination with the trip register, and means for returning it to the zero position, of a pivotally mounted direction plate, a double grooved cam, and an arm engaging said plate and having a stud engaging the cam, substantially as described.

23. In a register, the combination with the trip register, and a laterally moving and revoluble coupler for returning it to the zero position, of a direction plate, a double grooved cam carried by said coupler, and a laterally moving stud engaging the cam and connected with the direction plate, substantially as described.

In witness whereof we have signed our names, in the presence of two witnesses, this 6th day of October, 1891.

FRANCIS K. FASSETT.
GUSTAVUS REIN.

Witnesses:

GEO. EHRLICH,
H. G. BROWN.